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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/522,054	08/29/2005	Deliang Zhang	3392-00013	3959

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EXAMINER
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ZHU, WEIPING

ART UNIT	PAPER NUMBER
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1793

MAIL DATE	DELIVERY MODE
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10/01/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/522,054

**Applicant(s)**

ZHANG ET AL.

**Examiner**

WEIPING ZHU

**Art Unit**

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 September 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 26-29, 31, 34-37 and 47-57 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 26-29, 31, 34-37 and 47-57 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August 27, 2008 has been entered.

### ***Status of Claims***

2. Claims 26-29, 31, 34-37 and 47-57 are currently under examination wherein claim 26 have been amended in applicant's amendment filed on August 27, 2008.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 26, 31 and 47 are rejected under 35 U.S.C. 102(b) as being anticipated by Nagle et al. (US 4,921,531).

With respect to claims 26 and 47, Nagle et al. ('531) discloses a method of separating a ceramic component from a metal based composite comprising heating the metal-ceramic based composite, crushing the metal-ceramic based composite and separating the increased sized ceramic component from the other components to result

in a metal rich fraction (col. 10, lines 3-17, col. 13, lines 54-61, col. 15, lines 5-14 and col. 15, line 66 to col. 16, lines 33). Separating the ceramic component from the metal based composite of Nagle et al. ('531) (col. 10, lines 3-17) would inherently result in the recovery of both the ceramic and the metal matrix components of the composite of Nagle et al. ('531). The crushing step of Nagle et al. ('531) (col. 15, lines 5-14) would inherently have the same effects on the ceramic and the metal matrix components of the composite of Nagle et al. ('531) as on those of the claimed composite. Nagle et al. ('531) does not disclose that the size of the component within the metal based composite is increased by the heating. However, the instant claim 26 does not limit the size of the component before the heating. The examiner's interpretation is that the size of the component before the heating could be any sizes smaller than the sizes of the component after the heating, including the size of zero. The heating of Nagle et al. ('531) initiates a component forming reaction involving in situ precipitation and growth of the component within the metal based composite (col. 10, lines 3-17). Therefore, the heating of Nagle et al. ('531) inherently leads to the increase of the size of the component.

With respect to claim 31, Nagle et al. ('531) discloses that the metal in the metal based composite comprises titanium (col. 9, lines 11-19).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 27-29, 34-37 and 48-57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagle et al. ('531).

With respect to claims 27 and 28, Nagle et al. ('531) discloses the metal based composite is heated to a temperature of about 1600° C (col. 20, lines 8-12), which is within the claimed temperature range. A prima facie case of obviousness exists. See MPEP 2144.05 I. Nagle et al. ('531) does not specify the holding time at that temperature. However, it is well held that discovering an optimum value of a result-effective variable involves only routine skill in the art. In re Boesch, 617, F.2d 272, 205 USPQ 215 (CCPA 1980). In the instant case, the holding time at the heating temperature is a result-effective variable, because it would directly affect the precipitation of the component as disclosed by Nagle et al. ('531) (col. 10, lines 3-17). See MPEP 2144.05 II. It would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the holding time at the heating temperature as disclosed by Nagle et al. ('531) in order to achieve desired precipitation of the component in the metal based composite.

With respect to claim 29, Nagle et al. ('531) does not disclose the size of the component as claimed. However it has been well held where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical process, a prima facie case of either anticipation or obviousness has been established. In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977), MPEP 2112.01 [R-3] I. In the instant case, the claimed

and Nagle et al. ('531)'s metal based composites are identical or substantially identical in structure or composition and are produced by identical or substantially identical processes. A prima facie case of obviousness is established. The same size of the component would be expected in the metal based composite of Nagle et al. ('531) as in the claimed metal based composite.

With respect to claim 34, Nagle et al. ('531) discloses that the volume fraction of metal component of the metal based composite is 10-95% (col. 9, lines 40-42), which overlaps the claimed ranges in the instant claim 34. A prima facie case of obviousness exists. See MPEP 2144.05 I.

With respect to claims 35-37, Nagle et al. ('531) discloses that the component of the metal based composite comprises metal borides, carbides, oxides, nitrides and silicides and that the preferred metal constituents of the component include metals of Group IVB, VB and VIB of the Periodic Table (col. 8, lines 5-10), which read on the claimed features of the instant claims 35-37.

With respect to claims 48-50 and 52, Nagle et al. ('531) discloses that the metal based composite produced may be crushed, ground, milled etc. to decrease the geometric size (col. 15, lines 11-14), which reads on the claimed features of the instant claims 48 and 49. Nagle et al. ('531) further discloses that in order to minimize the surface contamination of the composite, such as the formation of oxide coatings, it may be desirable to perform some steps in a controlled environment, for example, in a vacuum or under an atmosphere of an inert gas (col. 14, lines 6-10), which reads on the claimed features on the instant claim 50. Nagle et al. ('531) further discloses that the

powder is mixed with a dissolution medium (col. 22, lines 1-5), which reads on the claimed features of the instant claims 52.

With respect to claim 51, Nagle et al. ('531) discloses that it is desired to decrease geometrical size of the composite by crushing or milling without limiting the crushing time or crushing and milling time as claimed (col. 15, lines 11-14). However, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the time of crushing or milling of Nagle et al. ('531) would be controlled not to reduce the size of the increase size of the component as claimed, because the increase size of the component is the desired size of the component as produced in the composite of Nagle et al. ('531) as disclosed by Nagle et al. ('531) (abstract).

With respect to claim 53, Nagle et al. ('531) discloses that the separation of the component is achieved by sedimentation (col. 7, lines 4-7).

With respect to claims 54 and 55, Nagle et al. ('531) does not specify the volume fraction of the metal component in the metal rich fraction as claimed. However, Nagle et al. ('531) discloses that the ceramic component is completely separated from the composite (col. 15, line 66 to col. 16, line 20), which obviously reads on the claimed feature, because after the complete separation of the ceramic component from the metal-ceramic based composite, the composite (i.e. the metal rich fraction as claimed) would inherently comprise mainly the metal component.

With respect to claims 56 and 57, Nagle et al. ('531) discloses that titanium oxide is treated at a high temperature with nitrogen in a reducing atmosphere to reduce the

oxygen content and to form titanium nitride (col. 3, lines 32-35), which reads on the claimed features of the instant claims 56 and 57.

***Response to Arguments***

5. The applicant's arguments filed on August 27, 2008 have been fully considered but they are not persuasive.

First, the applicant argues that the instant process involves recovering a metal rich fraction as opposed to recovering ceramic particles as described in Nagle et al. ('531) and the crushing step as claimed in the instant claim 26 reduces the size of the metal rich fraction in the composite versus the ceramic fraction. In response, see the reasons of rejections of these claimed features as state in the paragraph 3 above.

Second, the applicant argues that the instant invention does not involve a solvent metal matrix and there is no "crushing" step required by the process of Nagle et al. ('531). In response, the examiner notes that as stated in the paragraphs 3 and 4 above, the teaching of Nagle et al. ('531) anticipates and renders all of the claim limitations of the instant invention obvious to one of ordinary skill in the art. The objectives of Nagle et al. ('531) do not have to be the same as those of the instant invention. See MPEP 2144 [R-5].

Third, the applicant argues that the heating in Nagle et al. ('531) would be very unlikely to lead to an increase in size of the ceramic component; coarsening of the ceramic component in Nagle et al. ('531) would clearly be undesirable; and the size of the ceramic particles of Nagle et al. ('531) does not overlap the claimed size range. In response, the examiner notes that the process of Nagle et al. ('531) is directed to the in-



situ precipitation of fine particulate ceramics, whereby ceramic forming reactants react in a solvent metal during the heating to form a finely-divided dispersion of the ceramic particles in the solvent metal matrix (col. 10, lines 3-17). It would have been obvious to one of ordinary skill in the art at the time the invention was made that the size of the ceramic particle would increase or coarsen from zero to a desired size during the heating. The same size of the ceramic particles would be expected in the metal based composite of Nagle et al. ('531) as in the claimed metal based composite for the reason as stated in the paragraph 4 above..

#### ***Conclusion***

6. This Office action is made non-final. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Weiping Zhu whose telephone number is 571-272-6725. The examiner can normally be reached on 8:30-16:30 Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Roy King/  
Supervisory Patent Examiner, Art  
Unit 1793

WZ

9/25/2008

**Application Number****Application/Control No.**

10/522,054

**Examiner**

WEIPING ZHU

**Applicant(s)/Patent under  
Reexamination**

ZHANG ET AL.

**Art Unit**

1793